



PATENT TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

KESTUTIS J. TAUTVYDAS and JEFFREY F. ANDREWS

Serial No.: 09/696,635  
Filed: October 25, 2002

For: FRUIT, VEGETABLE, AND SEED  
DISINFECTANTS

Group Art Unit: 1617

Examiner: S. Jiang

PATENT  
Docket No.: 5519009

TECH CENTER 1600/2900  
SEP 0 9 2003

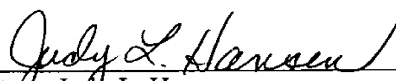
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on:

September 2, 2003

Date

  
Signature Judy L. Hansen

AFFIDAVIT UNDER 37 C.F.R. § 1.132

STATE OF MINNESOTA )  
 ) ss.  
COUNTY OF RAMSEY )

Jeffrey F. Andrews, being duly sworn, deposes and says that:

I.

1. I received a Bachelor of Science Degree in Pharmacy from the University of Minnesota.
2. From March 1974 to July 31, 2003, I was employed by Minnesota Mining and Manufacturing Company (3M), St. Paul, Minnesota, in the field of formulating of antimicrobial agents. At my retirement, I held the position of Senior Product Development Specialist at 3M, and am experienced in and familiar with antimicrobial compositions comprising fatty acid monoester (FAME) compositions and their uses in and on food products.

3. I am one of the co-inventors of the above-referenced patent application No. 09/696,635(Tautvydas et al.).

## II.

4. I have read the Office Action for U.S.S.N. 09/626,635 mailed January 29, 2003, and the cited references.

5. I am also one of the co-inventors in U.S. Patent No. 5,460,833 (Andrews et. al) which has been cited in the Office Action for U.S.S.N. 09/626,635 mailed January 29, 2003. Andrews taught the use of alpha-hydroxy organic acids such as lactic and malic acid.

6. Benzoic and salicylic acid are known to be weak antimicrobial agents, and more commonly considered antifungal agents. See Remington's Pharmaceutical Sciences, (14<sup>th</sup> Ed. 1970). In cases where benzoic acid, or more generally sodium benzoate, has been used as preservative in food, it has been considered at most to be a bacteriostatic agent, not a bacteriocidal agent that would result in fast, effective kill of bacteria.

7. Based on the known information regarding benzoic and salicylic acid, it would have not been obvious that either benzoic or salicylic acid, when combined with FAME, would provide synergistic kill against gram negative bacteria. The fact that a compound has known antimicrobial effects provides no indication whether the compound will have effective synergistic effects when combined with FAME.

8. Attached are the results of a bacterial kill – rate test performed on oranges using three different formulations comprising benzoic acid, salicylic acid, and lactic acid respectively. The method used was similar to that performed in the above referenced patent application on page 11, beginning at line 24. Note that the challenge organism in the attached test was an E. Coli cocktail prepared with four strains of bacteria, rather than the single strain as recited on page 11, line 30 of the above referenced patent application. The formulations were diluted 1:10 in water before application to the oranges.

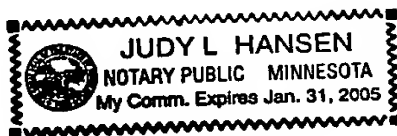
9. The attached test results show that benzoic and salicylic acid provide improved log reduction of gram negative bacteria within two minutes when compared to the same formulation using lactic acid. Based on the known narrow spectrum of antimicrobial activity of benzoic and salicylic acid, it was an unexpected and surprising result that these acids demonstrated synergistic effects with FAME, and that these results were superior to alpha-hydroxy organic acids such as lactic acid.

Further Affiant Saith Not.

Jeffrey F. Andrews  
Jeffrey F. Andrews

Subscribed and sworn to before me  
this 2nd day of September, 2003

Judy L. Hansen  
Notary Public



## Bacterial Kill-rate on Oranges Using Three Different Synergists

Formulation	Log Reduction		
	<u>30 Sec</u>	<u>60 Sec</u>	<u>120 Sec</u>
128774 –51A	1.65	1.66	2.38
128774 – 51B	0.90	1.31	1.61
128774 – 51C	1.09	1.02	1.29
Water control	1.04	1.20	1.16

The challenge organisms is an E. coli cocktail consisting of ATCC strains 11229, 35218, 25922, SP97-1. Initial inoculum count on the oranges was 5.88 logs per square centimeter of surface. The test temperature was 40C.

### Formulations

Components	Formulation Number		
	<u>128774-51A</u>	<u>128774-51B</u>	<u>128774-51C</u>
Propylene glycol monocaprates	10.00	10.00	10.00
Propylene glycol monocaprylate	10.00	10.00	10.00
Sodium lauryl sulfate	04.00	04.00	04.00
Pluronic P65	08.00	08.00	08.00
Salicylic acid	02.00	-----	-----
Benzoic acid	-----	02.00	-----
Lactic acid	-----	-----	02.00
Propylene glycol	66.00	66.00	66.00

### Suppliers of components:

Both propylene glycol monoesters supplied by Uniqema – Wilmington, Delaware

Sodium lauryl sulfate supplied by Sigma-Aldrich, St. Louis, MO

Pluronic P65 supplied by BASF, Mount Olive, NJ

Salicylic acid and Benzoic acid supplied by Mallinckrodt, Paris, KY

Lactic acid supplied by RITA, Woodstock, IL

Propylene glycol supplied by HCI, Great Lakes Region, St Paul, MN